AMENDMENT

Please amend the pending application in accordance with the following particulars.

In the Claims

The claims are amended as shown on the following pages under the heading LIST OF CURRENT CLAIMS. The list shows the status of all claims presently in the application and is intended to supersede all prior versions of the claims in the application. Any cancellation of claims is made without prejudice or disclaimer.

LIST OF CURRENT CLAIMS

1. (Currently Amended) A 2-dimensional code formation method comprising:

a step of specifying a fixed code size for a 2-dimensional code regardless of an amount of storage information to be written in said 2-dimensional code;

a step of specifying storage information to be written in said 2-dimensional code;

a step of calculating cell size for a unit cell of said 2-dimensional code providing storage of said storage information in said 2-dimensional code having said specified code size;

a step of specifying the dot step size or number of dots n x m (where n and m are natural numbers) to be arranged vertically and horizontally inside said unit cell;

a step of creating laser-marking information for forming said 2-dimensional code having said specified code size, based on said code size, said storage information, said cell size and said dot step size or number of dots, wherein said laser-marking information includes at least dot coordinate information; and

a step of laser marking said 2-dimensional code having said specified code size [[,]] by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m matrix array inside said unit cell based on said dot coordinate information of said laser-marking information by irradiating a laser beam directly on a material to be marked, wherein said dots are beam spots generated by irradiating a laser beam.

2. (Currently Amended) The 2-dimensional code formation method of claim 1 wherein the cell size of said unit cell is calculated by divided said specified code size by the number of code obtained by encoding said storage information into said 2-dimensional code changed according to change of said storage information.

3. (Currently Amended) The 2-dimensional code formation method of claim 1, further comprising:

specifying a number of said unit cells; and

wherein the cell size of said unit cell is calculated <u>by dividing</u> ~~based on~~ said specified code size <u>by</u> ~~and~~ said specified number of said unit cells.

4. (Currently Amended) A 2-dimensional code formation method for forming a 2-dimensional code on a product including a single part or a plurality of parts, and comprising:

a manufacturing-history-information-acquisition step of acquiring manufacturing-history information for said part;

a 2-dimensional-code-conversion step of converting data that includes an ID number for identifying manufacturing-history information or includes the manufacturing-history information itself for said part into a 2-dimensional code <u>and forming a 2-dimensional matrix data having 1 bit per cell</u>;

a parameter-setting step of setting a fixed size of said converted 2-dimensional code according to said part regardless of an amount of information to be written in said 2-dimensional code;

~~a data-size-converting step of converting said 2-dimensional code formed in said 2-dimensional-code-conversion step into data for said 2-dimensional code having said fixed size set in said parameter-setting step~~

<u>a data converting step of combining said 2-dimensional matrix data formed in said 2-dimensional-code-conversion step with said fixed size of said 2-dimensional code set in said 2-dimensional-code-conversion step and converting said combined information into data for laser marking said 2-dimensional code including beam spot coordinates</u>; and

a laser-marking step of laser marking said 2-dimensional code having said fixed size set in said parameter-setting step directly on said part by a laser marker <u>by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m (where n and m are natural numbers) matrix array inside a unit cell of said 2-</u>

dimensional code based on said beam spot coordinates converted in said data converting step, wherein said dots are beam spots generated by irradiating a laser beam.

5. (Canceled)

6. (Original) The 2-dimensional code formation method of claim 4 wherein said laser-marking step includes a process of reading said 2-dimensional code that was laser marked and checking whether or not marking of said 2-dimensional code is correct.

7. (Currently Amended) A 2-dimensional code formation device comprising:

information-acquisition means for acquiring the code size of a 2-dimensional code, storage information that is to be written in said 2-dimensional code, and the step size or number of dots n x m (where n and m are natural numbers) that are arranged vertically and horizontally inside a unit cell of said 2-dimensional code;

calculation means for performing a process of calculating the cell size of said unit cell, based on said code size and said storage information acquired by said information-acquisition means, to provide storage of said storage information in said 2-dimensional code having said acquired code size and a process of creating laser-marking information for forming said 2-dimensional code having said acquired code size, based on said code size, said storage information, said cell size and said step size or number of dots, wherein said laser-marking information includes at least dot coordinate information; and

laser-marking means for performing laser marking of said 2-dimensional code having said acquired code size by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m matrix array inside said unit cell based on said dot coordinate information of said laser-marking information by irradiating a laser

beam directly on a material to be marked, wherein said dots are beam spots generated by irradiating a laser beam; and

wherein said acquired code size is fixed regardless of an amount of storage information to be written in said 2-dimensional code.

8. (Currently Amended) The 2-dimensional code formation device of claim 7 wherein said calculation means calculates ~~performs a process of changing~~ the cell size of said unit cell by dividing said code size acquired by said information-acquisition means by the number of code obtained by encoding said storage information into said 2-dimensional code based on change information for said storage information that was acquired by said information-acquisition means.

9. (Previously Presented) The 2-dimensional code formation device of claim 7 wherein said calculation means performs a process of creating different laser-marking information having different density based on change information for said step size or number of dots that was acquired by said information-acquisition means.

10. (Currently Amended) A 2-dimensional code formation device comprising:

information-acquisition means for acquiring the code size of a 2-dimensional code, storage information that is to be written in said 2-dimensional code, the number of unit cells of said 2-dimensional code, and the dot step size or number of dots n x m (where n and m are natural numbers) arranged vertically and horizontally inside a unit cell of said 2-dimensional code;

calculation means for performing a process of calculating the cell size based on said code size and said number of cells acquired by said information-acquisition means, and a process of creating laser-marking information for forming said 2-dimensional code having said acquired code size, based on said code size, said storage

information, said cell size, and said dot step size or number of dots, wherein said laser-marking information includes at least dot coordinate information; and

laser-marking means for performing laser marking of said 2-dimensional code having said acquired code size by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m matrix array inside said unit cell based on said dot coordinate information of said laser-marking information by irradiating a laser beam directly on a material to be marked, wherein said dots are beam spots generated by irradiating a laser beam; and

wherein said acquired code size is fixed regardless of an amount of storage information to be written in said 2-dimensional code.

11. (Currently Amended) The 2-dimensional code formation device of claim 10 wherein said calculation means calculates performs a process of changing said cell size of unit cells by dividing said code size acquired by said information-acquisition means based on change information for by said number of cells that was acquired by said information-acquisition means.

12. (Previously Presented) The 2-dimensional code formation device of claim 10 wherein said calculation means performs a process of creating different laser-marking information having different density based on change information for said step size or number of dots that was acquired by said information-acquisition means.

13. (Currently Amended) A 2-dimensional code formation device that forms a 2-dimensional code on a product that is made from a single part or a plurality of parts, and comprising:

means for acquiring manufacturing-history information for said part/parts of a product;

means for storing the acquired manufacturing-history information;

means for converting data, which includes an ID number identifying said manufacturing-history information, or includes said manufacturing-history information itself, to said 2-dimensional code <u>and forming a 2-dimensional matrix data having 1 bit per cell</u>; ~~and~~

means for <u>setting</u> ~~converting said 2-dimensional code to data for said 2-dimensional code having~~ a fixed size <u>of said 2-dimensional code</u> ~~set~~ according to said part/parts regardless of an amount of information to be written into said 2-dimensional code<u>;</u>

<u>means for combining said 2-dimensional matrix data with said fixed size of said 2-dimensional code and converting said combined information data into data for laser marking said 2-dimensional code including beam spot coordinates; and</u>

<u>means</u> for performing laser marking of said 2-dimensional code directly on said part/parts <u>by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m (where n and m are natural numbers) matrix array inside a unit cell of said 2-dimensional code based on said beam spot coordinates, wherein said dots are beam spots generated by irradiating a laser beam.</u>